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1 [The elements of nature: interactive and realistic techniques](#)


 Oliver Deusen, David S. Ebert, Ron Fedkiw, F. Kenton Musgrave, Przemyslaw Prusinkiewicz,
Doug Roble, Jos Stam, Jerry Tessendorf

 August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

 Full text available: pdf(17.65 MB) Additional Information: [full citation](#), [abstract](#)

This updated course on simulating natural phenomena will cover the latest research and production techniques for simulating most of the elements of nature. The presenters will provide movie production, interactive simulation, and research perspectives on the difficult task of photorealistic modeling, rendering, and animation of natural phenomena. The course offers a nice balance of the latest interactive graphics hardware-based simulation techniques and the latest physics-based simulation techni ...

2 [Pen computing: a technology overview and a vision](#)



André Meyer

 July 1995 **ACM SIGCHI Bulletin**, Volume 27 Issue 3

Publisher: ACM Press

 Full text available: pdf(5.14 MB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

This work gives an overview of a new technology that is attracting growing interest in public as well as in the computer industry itself. The visible difference from other technologies is in the use of a pen or pencil as the primary means of interaction between a user and a machine, picking up the familiar pen and paper interface metaphor. From this follows a set of consequences that will be analyzed and put into context with other emerging technologies and visions. Starting with a short historic ...

3 [High dynamic range imaging](#)



Paul Debevec, Erik Reinhard, Greg Ward, Sumanta Pattanaik

 August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

 Full text available: pdf(20.22 MB) Additional Information: [full citation](#), [abstract](#)

Current display devices can display only a limited range of contrast and colors, which is one of the main reasons that most image acquisition, processing, and display techniques use no more than eight bits per color channel. This course outlines recent advances in high-dynamic-range imaging, from capture to display, that remove this restriction, thereby

enabling images to represent the color gamut and dynamic range of the original scene rather than the limited subspace imposed by current monitor ...

4 Special issue: AI in engineering



D. Sriram, R. Joobbani

April 1985 **ACM SIGART Bulletin**, Issue 92

Publisher: ACM Press

Full text available: pdf(8.79 MB) Additional Information: [full citation](#), [abstract](#)

The papers in this special issue were compiled from responses to the announcement in the July 1984 issue of the SIGART newsletter and notices posted over the ARPAnet. The interest being shown in this area is reflected in the sixty papers received from over six countries. About half the papers were received over the computer network.

5 Courses: Spatial augmented reality



Oliver Bimber, Ramesh Raskar

July 2006 **Material presented at the ACM SIGGRAPH 2006 conference SIGGRAPH '06**

Publisher: ACM Press

Full text available: pdf(22.57 MB) Additional Information: [full citation](#), [abstract](#)

A survey of the latest techniques for augmented reality, which go beyond conventional head-mounted displays. The tutorial introduces prototypes, explains rendering and calibration algorithms, discusses case studies, and presents practical experience. Attendees learn about new applications enabled by current augmented-reality techniques that combine the real and virtual worlds in art, science, education, and industry.

6 Risks to the public



P. G. Neumann

October 1987 **ACM SIGSOFT Software Engineering Notes**, Volume 12 Issue 4

Publisher: ACM Press

Full text available: pdf(1.60 MB) Additional Information: [full citation](#), [index terms](#)

7 A personal view of the personal work station: some firsts in the Fifties



Douglas Ross

January 1986 **Proceedings of the ACM Conference on The history of personal workstations**

Publisher: ACM Press

Full text available: pdf(4.26 MB) Additional Information: [full citation](#), [references](#), [index terms](#)

8 Dynamic allocation for scratch-pad memory using compile-time decisions



Sumesh Udayakumaran, Angel Dominguez, Rajeev Barua

May 2006 **ACM Transactions on Embedded Computing Systems (TECS)**, Volume 5 Issue 2


Publisher: ACM Press

Full text available: pdf(1.10 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this research, we propose a highly predictable, low overhead, and, yet, dynamic, memory-allocation strategy for embedded systems with scratch pad memory. A *scratch pad* is a fast compiler-managed SRAM memory that replaces the hardware-managed cache. It is motivated by its better real-time guarantees versus cache and by its significantly lower overheads in energy consumption, area, and overall runtime, even with a simple allocation scheme. Primarily scratch pad allocation methods are of ...

Keywords: Memory allocation, compiler, embedded systems, scratch pad, software caching, software-managed cache

9 Security on FPGAs: State-of-the-art implementations and attacks

 Thomas Wollinger, Jorge Guajardo, Christof Paar
August 2004 **ACM Transactions on Embedded Computing Systems (TECS)**, Volume 3 Issue 3

Publisher: ACM Press

Full text available:  pdf(296.79 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


In the last decade, it has become apparent that embedded systems are integral parts of our every day lives. The wireless nature of many embedded applications as well as their omnipresence has made the need for security and privacy preserving mechanisms particularly important. Thus, as field programmable gate arrays (FPGAs) become integral parts of embedded systems, it is imperative to consider their security as a whole. This contribution provides a state-of-the-art description of security issues ...

Keywords: Cryptography, FPGA, attacks, cryptographic applications, reconfigurable hardware, reverse engineering, security

10 System-level power optimization: techniques and tools


 Luca Benini, Giovanni de Micheli
April 2000 **ACM Transactions on Design Automation of Electronic Systems (TODAES)**, Volume 5 Issue 2

Publisher: ACM Press

Full text available:  pdf(385.22 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This tutorial surveys design methods for energy-efficient system-level design. We consider electronic systems consisting of a hardware platform and software layers. We consider the three major constituents of hardware that consume energy, namely computation, communication, and storage units, and we review methods of reducing their energy consumption. We also study models for analyzing the energy cost of software, and methods for energy-efficient software design and compilation. This survey ...

11 Special issue on knowledge representation

 Ronald J. Brachman, Brian C. Smith
February 1980 **ACM SIGART Bulletin**, Issue 70

Publisher: ACM Press

Full text available:  pdf(13.13 MB) Additional Information: [full citation](#), [abstract](#)

In the fall of 1978 we decided to produce a special issue of the SIGART Newsletter devoted to a survey of current knowledge representation research. We felt that there were two useful functions such an issue could serve. First, we hoped to elicit a clear picture of how people working in this subdiscipline understand knowledge representation research, to illuminate the issues on which current research is focused, and to catalogue what approaches and techniques are currently being developed. Second ...

12 The FINITE STRING Newsletter: Abstracts of current literature

Computational Linguistics Staff
January 1987 **Computational Linguistics**, Volume 13 Issue 1-2

Publisher: MIT Press

Full text available:  pdf(6.15 MB)  Additional Information: [full citation](#)
[Publisher Site](#)

13 Energy-aware design of embedded memories: A survey of technologies, architectures, and optimization techniques



Luca Benini, Alberto Macii, Massimo Poncino

February 2003 **ACM Transactions on Embedded Computing Systems (TECS)**, Volume 2 Issue 1

Publisher: ACM Press

Full text available: pdf(288.44 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Embedded systems are often designed under stringent energy consumption budgets, to limit heat generation and battery size. Since memory systems consume a significant amount of energy to store and to forward data, it is then imperative to balance power consumption and performance in memory system design. Contemporary system design focuses on the trade-off between performance and energy consumption in processing and storage units, as well as in their interconnections. Although memory design is as ...

Keywords: Embedded systems, embedded memories, integration, memories, nonvolatile, system-on-a-chip, volatile

14 Embedded hardware and system software: Hardware speech recognition for user interfaces in low cost, low power devices



Sergiu Nedeveschi, Rabin K. Patra, Eric A. Brewer

June 2005 **Proceedings of the 42nd annual conference on Design automation**

Publisher: ACM Press

Full text available: pdf(829.87 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We propose a system architecture for real-time hardware speech recognition on low-cost, power-constrained devices. The system is intended to support real-time speech-based user interfaces as part of an effort to bring Information and Communication Technologies (ICTs) to underdeveloped regions of the world. Our system architecture exploits a shared infrastructure model. The computationally intensive task of speech model training and retraining is performed offline by shared servers, while the actu ...

Keywords: ASIC, TIER, low power, speech recognition, tamil

15 "Empty space" computes: the evolution of an unconventional supercomputer



Jonathan W. Mills, Matt Parker, Bryce Himebaugh, Craig Shue, Brian Kopecky, Chris Weilemann

May 2006 **Proceedings of the 3rd conference on Computing frontiers CF '06**

Publisher: ACM Press

Full text available: pdf(1.82 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Lee A. Rubel defined the extended analog computer to avoid the limitations of Shannon's general purpose analog computer. Partial differential equation solvers were a "quintessential" part of Rubel's theoretical machine. These components have been implemented with "empty space," or VLSI circuits without transistors, as well as conductive plastic. For the past decade research at Indiana University has explored the design and applications of extended analog computers. The machines have become incre ...

Keywords: Lukasiewicz logic, extended analog computer, general purpose analog computer, hybrid digital-analog architecture

16

Courses: Exploiting perception in high-fidelity virtual environments



Mashhuda Glencross, Alan G. Chalmers, Ming C. Lin, Miguel A. Otaduy, Diego Gutierrez
July 2006 **Material presented at the ACM SIGGRAPH 2006 conference SIGGRAPH '06**

Publisher: ACM Press

Full text available: pdf(5.25 MB) Additional Information: [full citation](#), [abstract](#)

This course introduces high-fidelity virtual environments and explains the key components required to build compelling environments. Then it details perceptually inspired techniques that facilitate high-fidelity rendering, collaboration, and complex interaction in these virtual environments. Particular emphasis is placed on real applications, with several live demonstrations.

17 Ace: a language for parallel programming with customizable protocols



Mukund Raghavachari, Anne Rogers

August 1999 **ACM Transactions on Computer Systems (TOCS)**, Volume 17 Issue 3

Publisher: ACM Press

Full text available: pdf(297.50 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

Customizing the protocols that manage accesses to different data structures within an application can improve the performance of software shared-memory programs substantially. Existing systems for using customizable protocols are hard to use directly because the mechanisms they provide for manipulating protocols are low-level ones. This article is an in-depth study of the issues involved in providing language support for application-specific protocols. We describe the design and implementat ...

Keywords: parallel processing

18 In-network processing: Data compression algorithms for energy-constrained devices in delay tolerant networks



Christopher M. Sadler, Margaret Martonosi

October 2006 **Proceedings of the 4th international conference on Embedded networked sensor systems SenSys '06**

Publisher: ACM Press

Full text available: pdf(428.25 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Sensor networks are fundamentally constrained by the difficulty and energy expense of delivering information from sensors to sink. Our work has focused on garnering additional significant energy improvements by devising computationally-efficient lossless compression algorithms on the source node. These reduce the amount of data that must be passed through the network and to the sink, and thus have energy benefits that are multiplicative with the number of hops the data travels through the network ...

Keywords: data compression, energy efficient communications, mobile ad hoc networks, wireless sensor networks

19 Risks to the public in computers and related systems



Peter G. Neumann

April 1991 **ACM SIGSOFT Software Engineering Notes**, Volume 16 Issue 2

Publisher: ACM Press

Full text available: pdf(1.56 MB) Additional Information: [full citation](#), [index terms](#)


20

Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies
on Collaborative research**

Publisher: IBM Press

Full text available:  pdf(4.21 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

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L2	118094	flash adj memory	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L3	8754	eras\$4 near2 block\$2	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L4	1510077	module\$2 or chip\$2	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L5	84406	(new or update\$) adj data	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L6	85118	(new or update\$ or fresh\$4) adj data	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L7	4583	((new or update\$ or fresh\$4) adj data) near3 (writ\$4 or stor\$4)) same (chip\$2 or module\$2 or unit\$2)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L8	118094	flash adj memory	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L9	8754	eras\$4 near2 block\$2	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09

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L10	5597	L8 and L9	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
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L12	5597	L8 and L9	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L13	260	L11 and L12	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
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L15	680	((new or update\$ or fresh\$4) adj data) near3 (writ\$4 or stor\$4)) same (chip\$2 or module\$2 or unit\$2) same "same"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L16	64	L12 and L15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L17	134	(Tomohiro near Hayashi).in.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L18	64	L12 and L15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L19	134	(Tomohiro near Hayashi).in.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09

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L21	73758	(data near2 size)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L22	519809	(estimat\$5 or determin\$4) near4 (time or power)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
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L25	1100	L23 same L24	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L26	1884	"711"/103.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L27	1100	L23 same L24	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L28	1884	"711"/103.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L29	12	L27 and L28	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09

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L31	31991	"711"/\$.cls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:10
L32	497	(size near2 data) same (estimat\$4 or determin\$4) same ("how long" or power)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:10
L33	36	L31 and L32	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:19
L34	2419	(available near4 electric near power)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:20
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L2	118094	flash adj memory	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
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L7	4583	((new or update\$ or fresh\$4) adj data) near3 (writ\$4 or stor\$4)) same (chip\$2 or module\$2 or unit\$2)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L8	118094	flash adj memory	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L9	8754	eras\$4 near2 block\$2	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09

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L10	5597	L8 and L9	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
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L12	5597	L8 and L9	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L13	260	L11 and L12	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L14	680	(((new or update\$ or fresh\$4) adj data) near3 (writ\$4 or stor\$4)) same (chip\$2 or module\$2 or unit\$2) same "same"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
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L17	134	(Tomohiro near Hayashi).in.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L18	64	L12 and L15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L19	134	(Tomohiro near Hayashi).in.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09

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L22	519809	(estimat\$5 or determin\$4) near4 (time or power)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L23	73758	(data near2 size)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
L24	519809	(estimat\$5 or determin\$4) near4 (time or power)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:09
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L32	497	(size near2 data) same (estimat\$4 or determin\$4) same ("how long" or power)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:10
L33	36	L31 and L32	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:19
L34	2419	(available near4 electric near power)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:20
L35	0	33 and 34	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/12/10 18:20